

# Description of a new species of *Sylvisorex* (Insectivora: Soricidae) from Tanzania

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## Introduction

Two species of *Sylvisorex* are known from Tanzania, *S. granti* Thomas, 1907 which has been reported from Mount Kilimanjaro and *S. megalura* (Jentink, 1888) of which specimens from three separate localities have been recorded recently by Howell & Jenkins (in press). In the course of organised collecting in Tanzania, Dr K. M. Howell of the University of Dar-es-Salaam obtained a number of shrews which were submitted to the British Museum (Natural History) for identification. These include a single example of *Sylvisorex* which on examination proves to differ substantially from all the known species of the genus in size and dental morphology, which is described here as new. The specimen differs externally from other members of the genus in the presence of bristle-hairs on the tail. The absence of such bristle-hairs has been used to distinguish *Sylvisorex* from *Suncus* but this distinction must now depend on the cranial differences elaborated by Heim de Balsac & Lamotte (1957) plus the dental characters used by Repenning (1967) and Butler & Greenwood (1979). The most readily applied of these latter characters is the presence of denticulations on the cutting surface of the first lower incisor in *Sylvisorex*, which are lacking in *Suncus*; also in *Sylvisorex* the talon of the upper premolar is more highly developed, the interorbital region broader and the braincase broader and higher relative to skull size. Additionally the hindfeet in *Sylvisorex* are larger relative to body size with slightly elongated, staggered, separated, metatarsal pads, while *Suncus* has smaller hindfeet with more oval, more or less adpressed pads.

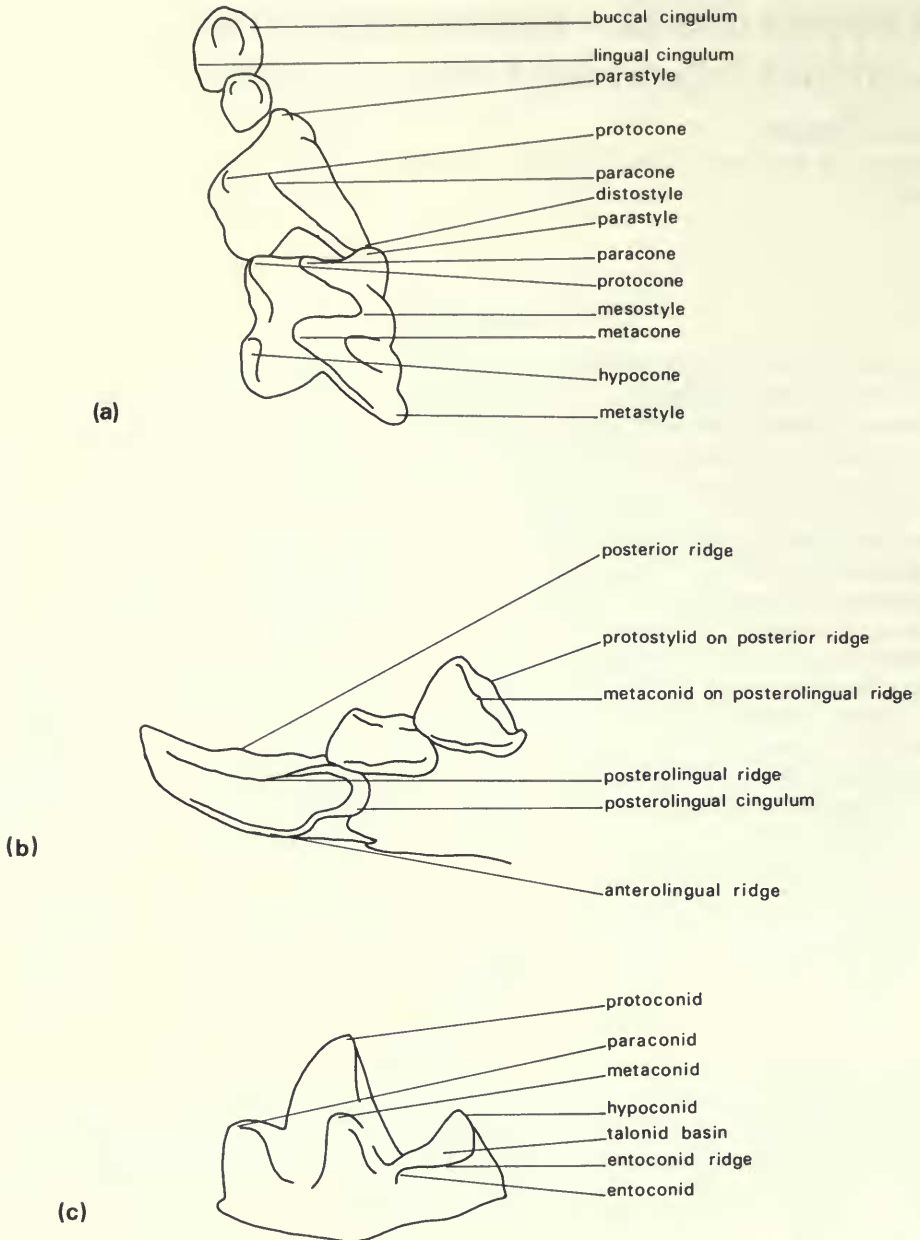
All measurements are in millimetres; the dental nomenclature follows that of Swindler (1976), Butler & Greenwood (1979) and is illustrated in Figure 1.

## Systematic Section

*Sylvisorex howelli* sp. nov.

HOLOTYPE. BM(NH) 82.874 adult of undetermined sex (viscera and external genitalia removed) in alcohol, skull removed; collected 27 April 1982 on Bondwa Peak, Uluguru North Forest Reserve, Uluguru Mountains, Morogoro District, Tanzania, c. 06°54'S 37°40'E, c. 1050 m on road through forest by M. K. S. Maige and donated by Dr K. M. Howell.

DIAGNOSIS. Small, size intermediate between *S. johnstoni* (Dobson, 1888) and *S. granti*; tail with bristle-hairs; braincase shallow and long, relative to skull length; lingual edge of second upper unicuspid projecting beyond that of first, level with lingual edge of third unicuspid; crown area of fourth upper unicuspid smaller than crown area of second upper unicuspid; parastyle of upper premolar low and slender; posterolingual ridge on first lower incisor very prominent, forming a small cusp; talonid of third lower molar reduced. (See Figs 2-8).



**Fig. 1** Diagrams to show cusp nomenclature: (a) crown view of left upper third and fourth unicuspid, premolar and first molar; (b) lingual view of right lower first and second incisors and premolar; (c) lingual view of right lower third molar.

**DESCRIPTION.** Size small (head and body length 48, tail length 44.5, hindfoot length without claws 11.5, ear length 6.8); dorsally dark brown, the hairs basally grey but brown medially and terminally; ventral pelage paler brown, the hairs with light grey bases and light brown tips; a gradual transition along flanks between colour of dorsum and venter; ears, limbs and dorsal surface of tail dark brown, their ventral surfaces paler, lacking any sharp lateral demarcation; the tail with a cover of short hairs along its entire length, interspersed with longer bristle hairs on the basal two-thirds.



Fig. 2 Dorsal view of skulls of *Sylvisorex*. Top row from left to right: *S. johnstoni*, *S. howelli*, *S. granti* and *S. megalura*; lower row from left to right: *S. morio*, *S. lunaris* and *S. ollula*. Scale in mms.

Skull small (see Table 1), mostly lacking any exceptional features, but cranial profile sloping gradually upwards from tip of rostrum to posterior part of inter-orbital region then sloping more steeply to a rounded braincase which is long, not especially broadened and shallower relative to skull length than in other members of the genus (Figs 2–4); mandible with short, broad ascending ramus (Fig. 5).

Posterior portion of upper incisor ( $I^1$ ) only slightly wider than remainder of tooth, the distance between posterior part of incisors just greater than the width of one incisor. First upper unicuspid ( $Un^1$ ) sub-oval, with straight-edged lingual cingulum, tapering anteriorly and lacking any posterior cingular ridge; second upper unicuspid ( $Un^2$ ) with broad lingual cingulum, approximately twice as broad as buccal cingulum, its lingual edge projecting beyond that of  $Un^1$  and level with that of third upper unicuspid ( $Un^3$ );  $Un^3$  with broad lingual cingulum, the tooth tapering anteriorly and rounded in crown view; fourth upper unicuspid ( $Un^4$ ) with broad lingual cingulum, the tooth almost round in crown aspect and smaller than  $Un^2$ . Parastyle of upper premolar ( $P^4$ ) low and slender; talon posteriorly and lingually expanded, its posterior edge level with distostyle; least internal distance between premolars ( $P^4$ – $P^4$ ) approximately three-quarters of the width of one premolar. Talon of first and second



Fig. 3 Ventral view of skulls of *Sylvisorex*. Top row from left to right: *S. johnstoni*, *S. howelli*, *S. granti* and *S. megalura*; lower row from left to right: *S. morio*, *S. lunaris* and *S. ollula*. Scale in mms.

upper molars ( $M^1$  and  $M^2$ ) only slightly expanded lingually, its lingual edge straight but expanded posteriorly, so that its posterior edge is level with metastyle. Third upper molar ( $M^3$ ) with a long ridge between parastyle and paracone, the ridge between paracone and protocone and that between metacone and mesostyle short, angle between protocone, metacone and midline of palate shallow; talon well-developed. Lower incisor ( $I_1$ ) long, slightly curved and approximately the same vertical diameter (in lateral aspect) for most of its length, tapering gradually to its tip; two rounded elevations on posterior ridge, anterior elevation long and low; posterolingual ridge prominent, forming a small cusp, higher than posterior ridge; lingual enamel extension reaching level of protoconid of second lower incisor ( $I_2$ ); lingual groove extending along length of tooth and terminating just anteriorly to notch at base of lateral enamel extension; anterolingual ridge present but poorly developed, not extending onto lateral enamel extension; no posterolingual cingulum.  $I_2$  anteroposteriorly slightly lengthened; posterolingual ridge well-developed; no protostylid. Posterior ridge of fourth lower premolar ( $P_4$ ) lacking protostylid; metaconid on posterolingual ridge barely marked. Anterior ridge of entoconid of first and second molars ( $M_1$  and  $M_2$ ) poorly developed, not divergent from lingual side of tooth, the entoconid conical; postentoconid



Fig. 4 Left lateral view of skulls of *Sylviovorex*. Top row from left to right: *S. johnstoni*, *S. howelli*, *S. granti* and *S. megalura*; lower row from left to right: *S. morio*, *S. lunaris* and *S. ollula*. Scale in mms.



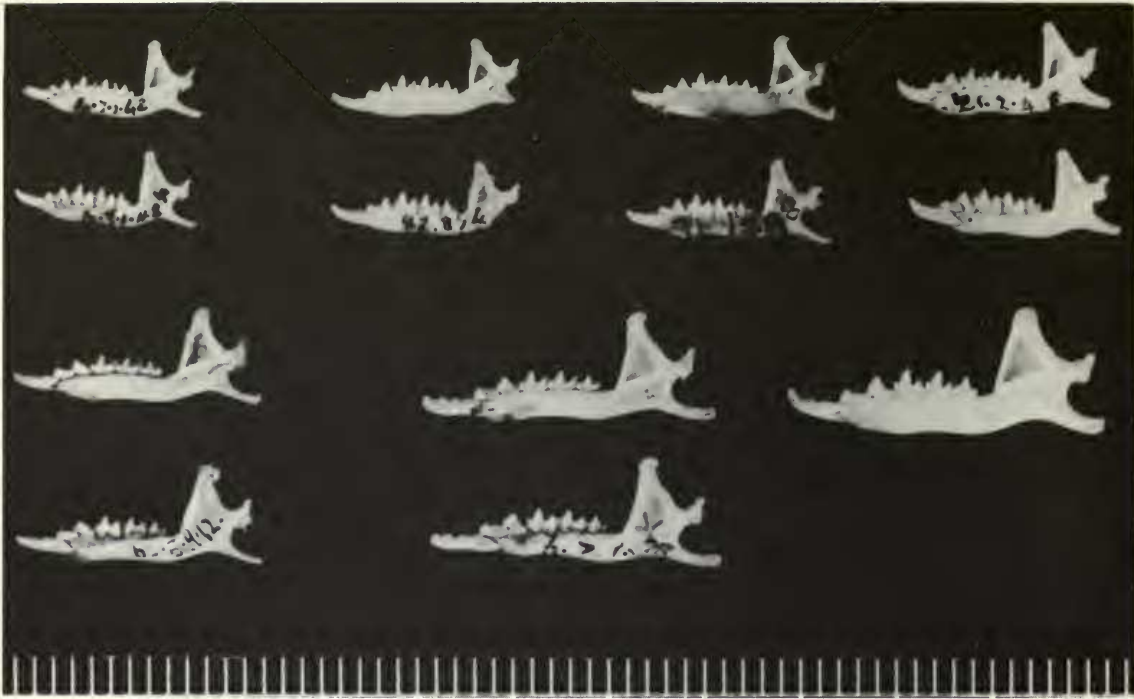


Fig. 5 Lateral view of mandibles of *Sylvisorex*. Top two rows, above—lingual view of right mandibular ramus, below—labial view of left mandibular ramus, from left to right: *S. johnstoni*, *S. howelli*, *S. granti* and *S. megalura*; lower two rows, above—lingual view of right mandibular ramus, below—labial view of left mandibular ramus, from left to right: *S. morio*, *S. lunaris* and *S. ollula* (left mandibular ramus absent). Scale in mms.

ledge present, adjacent to base of entoconid; lingual cingulum of  $M_1$  weakly developed anteriorly, absent from  $M_2$ ; the buccal cingulum continuing round hypoconid and merging with posterolingual rib on  $M_1$  but on  $M_2$  narrow and merging with posterior part of hypoconid. Talonid of third lower molar ( $M_3$ ) reduced, the talonid basin reduced, the entoconid and the posterolingual rib absent but an entoconid ridge present.

ETYMOLOGY. The name of the new species is derived from that of Dr K. M. Howell of the University of Dar-es-Salaam, who kindly donated this specimen.

### Comparison with other species

#### Key to the species of *Sylvisorex*

- |    |   |                    |   |
|----|---|--------------------|---|
| 1. | Large, condylobasal length (CBL) > 23, upper tooththrow length (UTL) > 10   | <i>S. ollula</i>   | 2 |
|    | Smaller, CBL < 23, UTL < 10   |                    |   |
| 2. | Larger, CBL > 18, UTL > 8   |                    | 3 |
|    | Smaller, CBL < 18, UTL < 8  |                    | 4 |
| 3. | Larger, CBL > 20, UTL > 9, talonid of third lower molar ( $M_3$ ) more reduced than that of second lower molar ( $M_2$ ), third upper molar ( $M^3$ ) anteroposteriorly compressed, < 7.5% of UTL | <i>S. lunaris</i>  |   |
|    | Smaller, CBL < 20, UTL < 9, talonid of $M_3$ similar to that of $M_2$ , $M^3$ not anteroposteriorly compressed, > 9% of UTL   | <i>S. morio</i>    |   |
| 4. | Tail longer than head and body, braincase narrow, braincase breadth (BB) < 48% of CBL   | <i>S. megalura</i> |   |
|    | Tail equal to or shorter than head and body, braincase broader, BB > 48% of CBL   |                    | 5 |

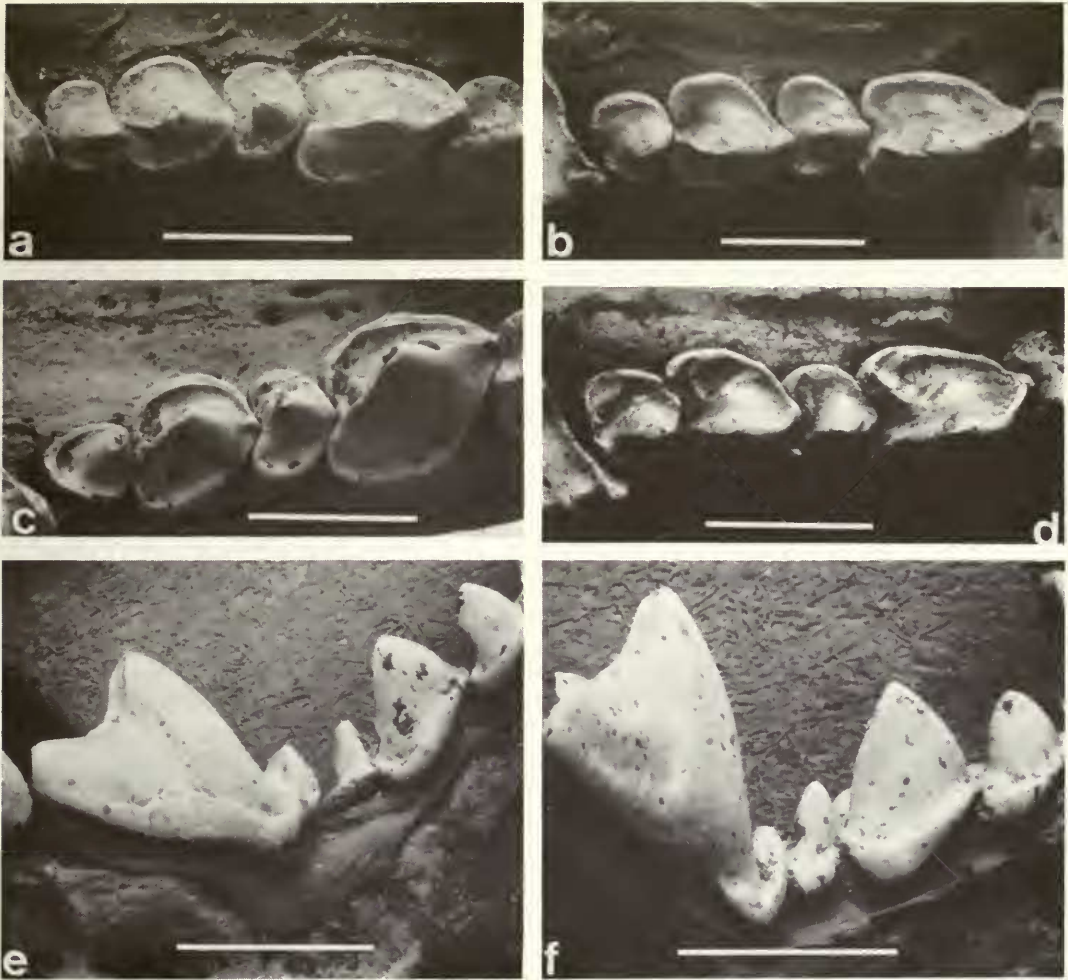
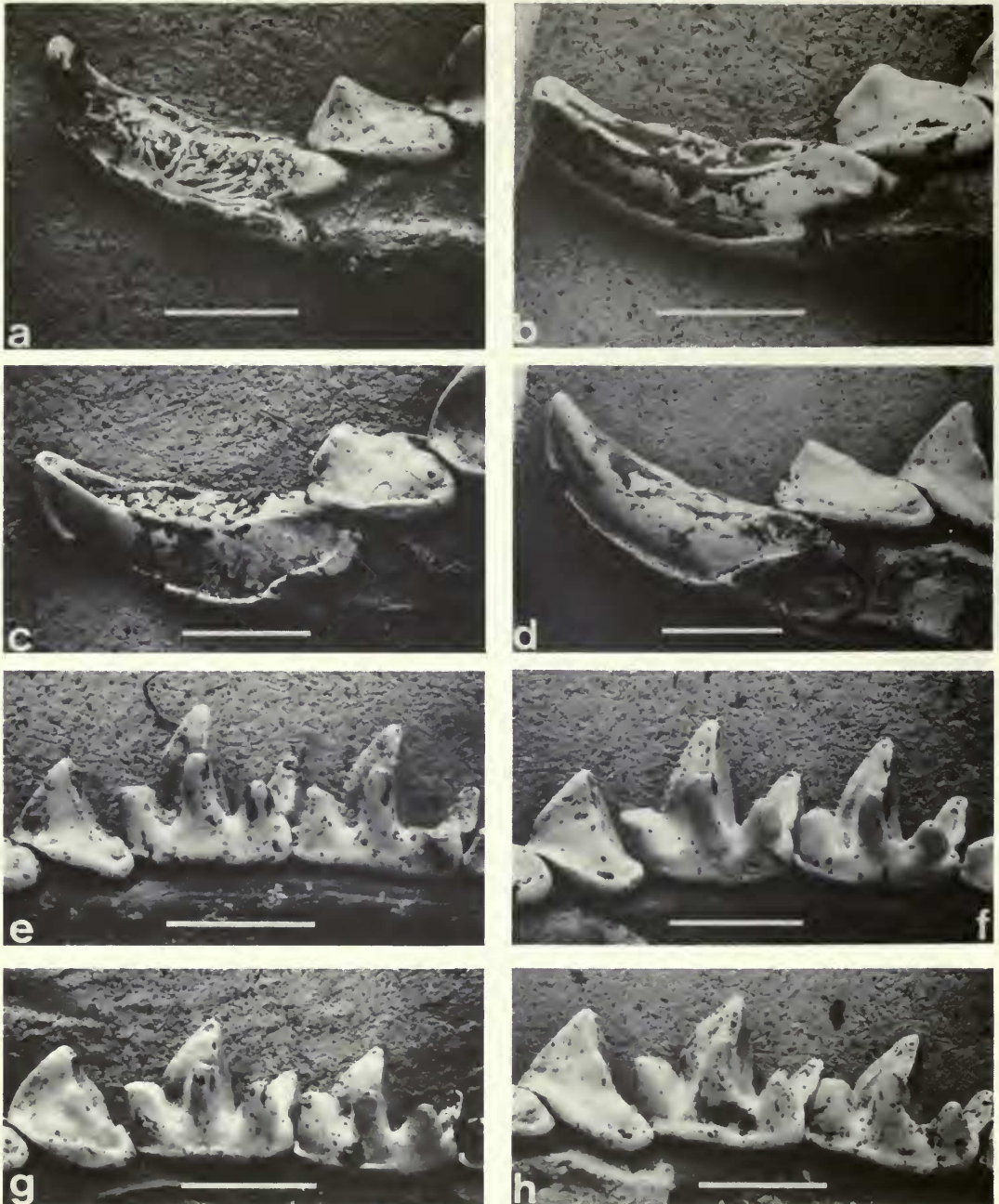


Fig. 6 (a-d) Crown view of left upper unicuspid: (a) *S. johnstoni*; (b) *S. howelli*; (c) *S. granti*; (d) *S. megalura*. (e-f) Labial view of left upper second, third and fourth unicuspid and pre-molar: (e) *S. granti*; (f) *S. howelli*. Scales 1 mm.

- |    |  |                     |
|----|--|---------------------|
| 5. | Small, CBL < 15, UTL up to 6.5, M <sup>3</sup> anteroposteriorly compressed, < 8% of UTL, talonid of M <sub>3</sub> reduced to a single cusp         | <i>S. johnstoni</i> |
|    | Larger, CBL > 15, UTL > 6.5, M <sup>3</sup> not anteroposteriorly compressed, > 8% of UTL, talonid of M <sub>3</sub> less reduced                    |                     |
| 6. | Tail lacking bristle-hairs, braincase deep, braincase height (BH) 4.5-5.0, > 27% of CBL, talonid of M <sub>3</sub> similar to that of M <sub>2</sub> | <i>S. granti</i>    |
|    | Tail with bristle-hairs, braincase shallow, BH 4.1, < 27% of CBL, talonid of M <sub>3</sub> reduced but talonid basin and entoconid ridge present.   | <i>S. howelli</i>   |

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*S. howelli* is intermediate in size between the smaller *S. johnstoni* and the slightly larger *S. granti* but smaller than all other members of the genus (Table 1 & Figs 2-5). *S. morio* (Gray, 1862) *S. lunaris* Thomas, 1906 and *S. ollula* Thomas, 1913 are readily distinguished from *S. howelli* by their much greater size and require no further detailed comments; their measurements are included in table 1 for comparative purposes.



**Fig. 7** (a-d) Lingual view of right lower first and second incisors. (e-h) Lingual view of right lower premolar and first and second molars. (a & e) *S. johnstoni*; (b & f) *S. howelli*; (c & g) *S. granti*; (d & h) *S. megalura*. Scales 1 mm.

The skull of *S. howelli* has a moderately broad, shallow, long braincase relative to skull length, in comparison with other members of the genus (Table 2 & Figs 2-4). *S. johnstoni* has a broad, moderately deep and long braincase; *S. granti* has a broad, deep, moderately long braincase and *S. megalura* a narrow, moderately deep and long braincase.



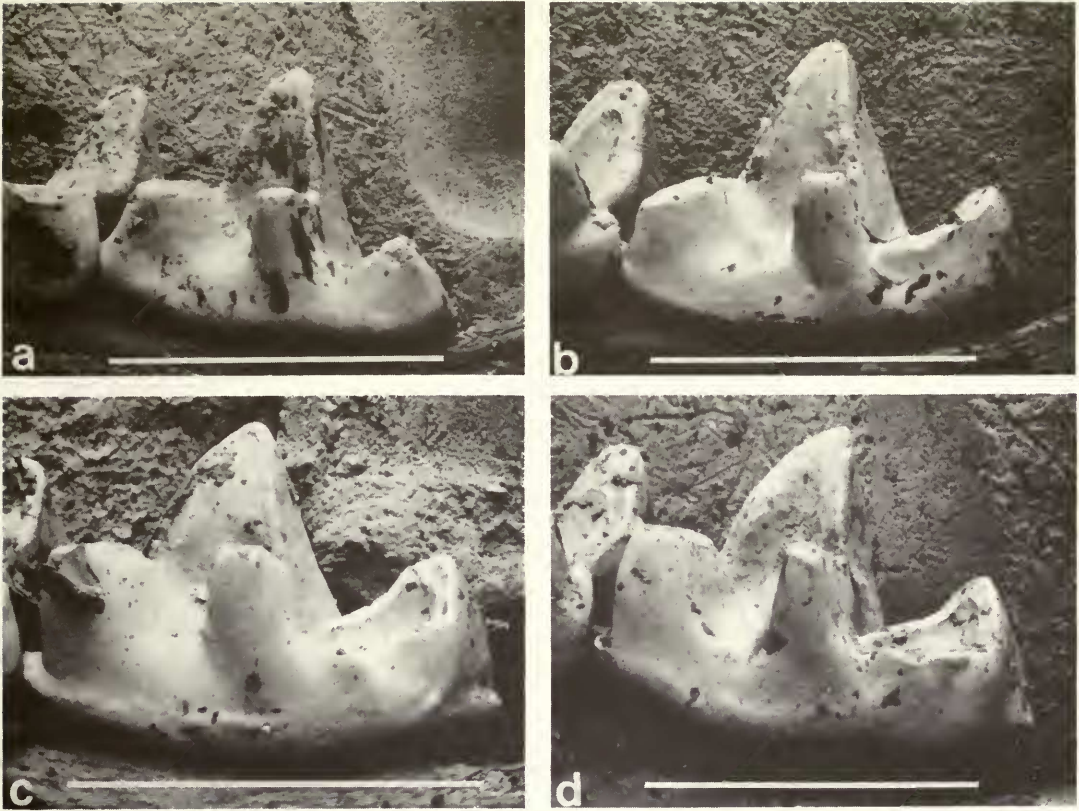


Fig. 8 Lingual view of right lower third molar: (a) *S. johnstoni*; (b) *S. howelli*; (c) *S. granti*; (d) *S. megalura*. Scales 1 mm.

The ascending ramus of the mandible is rather short and broad in *S. howelli* (Fig. 5). The ramus in *S. johnstoni* is high and narrow. Height of the ascending ramus at the coronoid process is less in *S. howelli* than in *S. granti* or *S. megalura* (Table 1).

The dentition of *S. howelli* is distinctive (see description). The main differences between the four species are illustrated in figures 6–8 and discussed below. The degree of development of the lingual cingulum on the upper unicuspid varies from broad in *S. johnstoni* and *S. granti* to very broad in *S. megalura* and *S. howelli* (Fig. 6). In *S. howelli* the lingual edge of the second upper unicuspid projects beyond that of the first and is level with that of the third, while in the other three species the lingual edge of the second upper unicuspid does not project as far as that of the first and third unicuspid.

The parastyle of the upper premolar is low and slender in *S. howelli* but medium in height and well developed in the other three species. *S. granti* is illustrated as an example of the condition in all three species in comparison with *S. howelli* (Fig. 6).

The third upper molar is a large tooth in *S. granti* and *S. megalura*, it is somewhat smaller in *S. howelli* but is anteroposteriorly compressed in *S. johnstoni* (Table 1).

The posterolingual ridge of the first lower incisor ( $I_1$ ) is higher than the posterior ridge and forms a small cusp in *S. howelli*, unlike the condition in the other three species (Fig. 7). The anterolingual ridge of  $I_1$  does not extend onto the lateral enamel extension and a posterolingual cingulum is absent in *S. johnstoni* and *S. howelli*. In *S. granti* and *S. megalura* there is a well developed anterolingual ridge, extending onto the lateral enamel extension to form a posterolingual cingulum.

Table 1

	<i>S. johnstoni</i>	<i>S. howelli</i>	<i>S. granti</i>	<i>S. megalaria</i>	<i>S. morio</i>	<i>S. lunaris</i>	<i>S. ollula</i>
Condylobasal length	$\bar{x}$ 13.9-14.5 14.21	15.9	15.8-16.9 16.41	16.4-17.6 17.06	18.2-18.8 18.43	20.9-21.8 21.35	23.5-24.0 23.75
Upper tooththrow length	$\bar{x}$ 6.1-6.5 6.35	7.0	6.7-7.3 7.07	7.2-7.6 7.38	8.3-8.4 8.34	9.5-9.8 9.67	10.5
Maxillary breadth at level of M <sup>2</sup>	$\bar{x}$ 4.45-4.7 4.59	4.7	4.7-5.3 4.90	4.7-5.2 5.00	5.2-5.4 5.30	5.7-6.1 5.90	6.8-7.1 6.95
Least interorbital breadth	$\bar{x}$ 3.35-3.6 3.46	3.7	3.8-4.3 3.98	3.7-4.0 3.86	4.3-4.6 4.43	4.4-4.6 4.50	4.9-5.3 5.10
Length of mandible	$\bar{x}$ 7.49-7.9 7.66	8.0	7.8-8.9 8.45	8.6-9.1 8.79	9.8-10.35 10.08	10.7-11.6 11.13	13.1-13.7 13.40
Height of ascending ramus of mandible at coronoid process	$\bar{x}$ 3.5-3.7 3.6	3.6	3.7-4.0 3.87	3.9-4.3 4.03	4.2-4.4 4.30	4.9-4.5 5.20	5.9-6.5 6.20
Length of M <sup>3</sup> as a % of upper tooththrow length	$\bar{x}$ 7.49-7.9 7.74	8.6	9.0-9.7 9.37	8.8-9.7 9.26	9.0-9.6 9.40	6.8-7.2 7.07	5.7
	$n$ 7 6	1	9 9	9 9	3 3	3 3	1 1

 $\bar{x}$  = mean;  $n$  = sample size.

Table 2

		<i>S. johnstoni</i>	<i>S. howelli</i>	<i>S. granti</i>	<i>S. megalura</i>
Braincase breadth		7.0-7.5	7.7	8.0-8.6	7.6-8.1
	$\bar{x}$	7.30		8.28	7.84
Braincase height	n	7	1	11	9
	$\bar{x}$	3.8-4.0	4.1	4.5-5.0	4.4-4.7
Braincase length	n	7	1	11	9
	$\bar{x}$	5.6-5.8	6.8	6.6-7.1	6.8-7.4
Braincase breadth as a % of condylobasal length	n	7	1	11	9
	$\bar{x}$	49.0-54.0	48.4	49.1-51.9	43.7-47.6
Braincase height as a % of condylobasal length	n	7	1	11	9
	$\bar{x}$	26.6-28.1	25.8	27.5-30.9	25.9-28.3
Braincase length as a % of condylobasal length	n	7	1	11	9
	$\bar{x}$	39.6-41.1	42.8	40.7-42.6	40.8-42.0

$\bar{x}$  = mean; n = sample size.

A posterolingual ridge is present on the second lower incisor of *S. howelli*, it is weakly developed in *S. granti* and *S. megalura* but absent from *S. johnstoni* (Fig. 7).

There is no protostylid and a metaconid is barely indicated on the lower premolar of *S. howelli*; both protostylid and metaconid are lacking in *S. johnstoni*; both protostylid and metaconid are present in *S. granti*, while a metaconid only is present in *S. megalura* (Fig. 7). In all three species except *S. howelli*, a small cusplet is present in the posterior part of the valley between the posterior ridge and the posterolingual ridge.

The talonid of the third lower molar is reduced to a single cusp, the hypoconid, in *S. johnstoni* (Fig. 8). It is reduced to a small talonid basin and an entoconid ridge in *S. howelli*. In *S. granti* and *S. megalura* less reduction has occurred and the talonid resembles that of the second lower molar.

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